

CLAIMS

What is claimed:

1. A method for defining tone signals in a voice activity detection (VAD) device, comprising:
 - defining a threshold for zero amplitude change;
 - calculating a zero crossing rate of a signal;
 - extracting a set of parameters from a plurality of duration periods of said signal;
 - defining a tolerance threshold between said plurality of duration periods when a zero amplitude change occurs;
 - calculating a maximum difference between said plurality of duration periods; and
 - comparing said maximum difference with said threshold.
2. The method of claim 1, wherein said calculating said zero crossing rate comprises:
 - determining, for a signal sample with a zero value amplitude at the zero crossing point, a tangent value of the sample; and
 - defining the zero value amplitude as a non-zero value depending upon the tangent of said sample point.
3. The method of claim 2, wherein said defining comprises defining said zero value

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amplitude according to whether said tangent is positive or negative.

4. The method of claim 1, wherein said calculating said maximum difference comprises calculating a product between the sample and the sample's adjacent sample in a group of signal samples.

5. The method of claim 1, further comprising:
defining a range of said signal that does not contain a zero crossing point;
comparing said range with said threshold.

6. The method of claim 1, wherein the maximum difference is calculated between a sum of all said durations and a single said duration.

7. The method of claim 1, wherein the maximum difference is calculated using a mean difference between a sum of all said durations and a single duration.

8. The method of claim 1, wherein the method defines tone signals according to an International Telecommunications Union (ITU) recommendation G.729 Annex B VAD device.

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